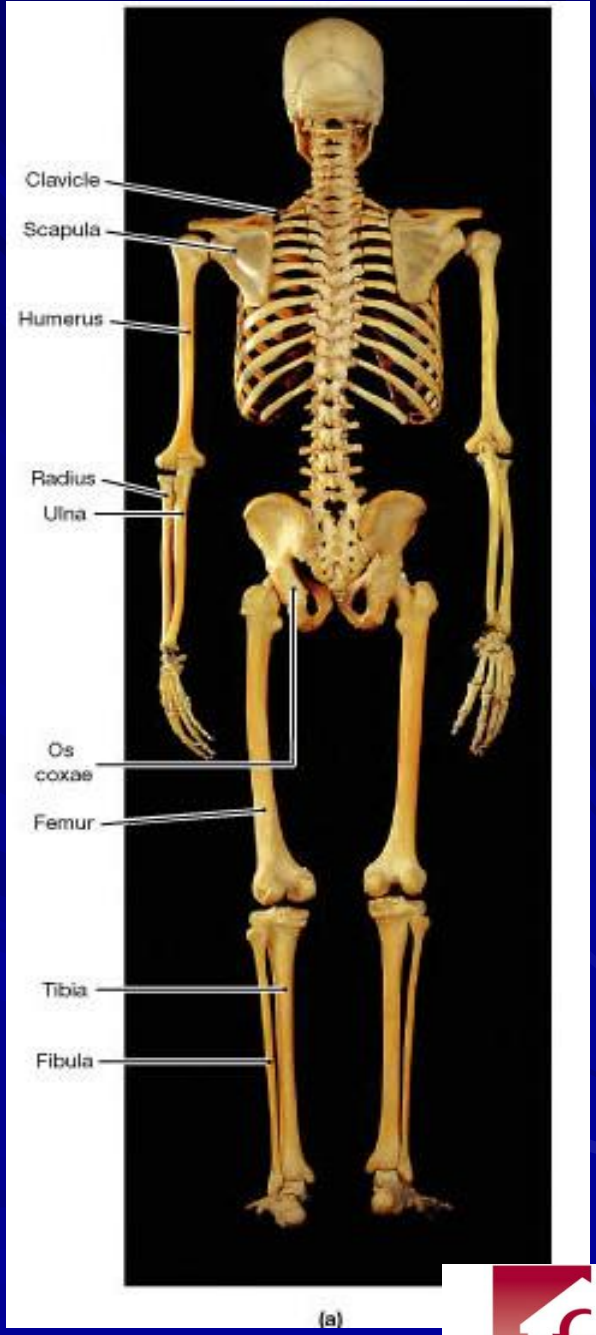
- *repetitio est mater studiorum*
  - *repetition is the mother of learning*

Superficial, big, important

Chapter 7, Bones, Part 1: The Axial Skeleton

- Skull
- Spine
- Sternum
- Ribs
- Auditory ossicles
- Hyoid Bone

thorax

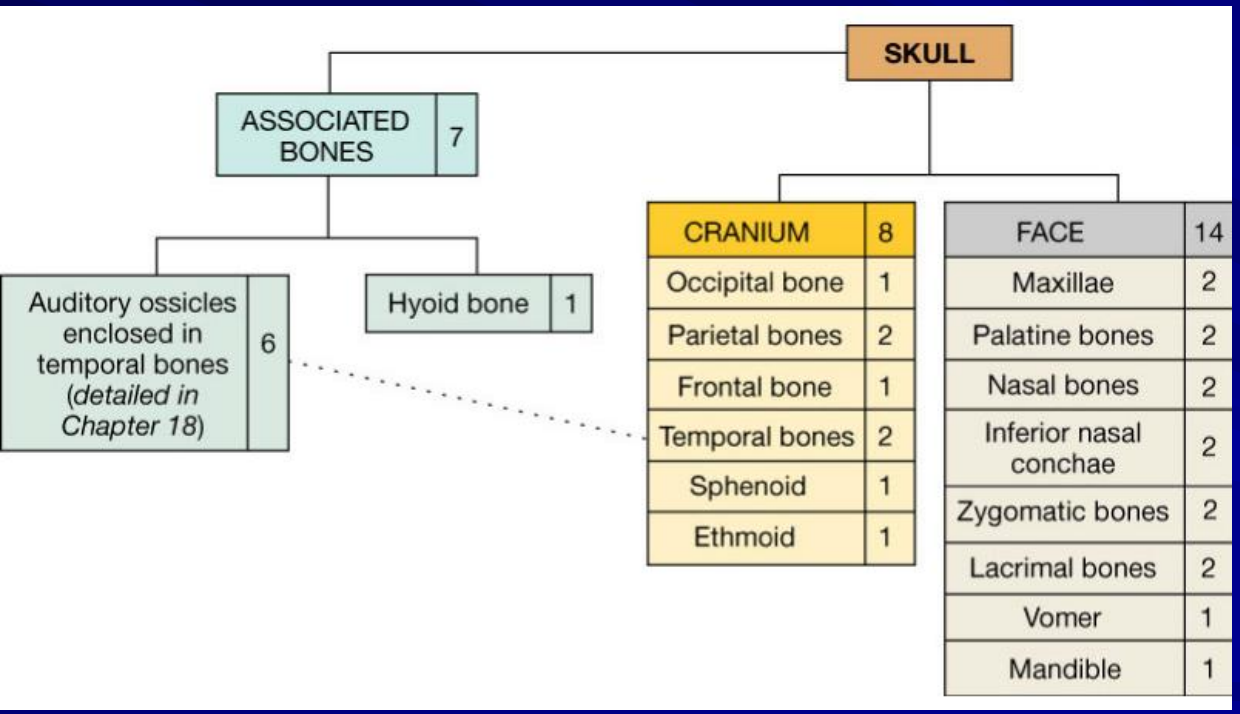


Goal: Learn and locate the bones and markings of the axial skeleton

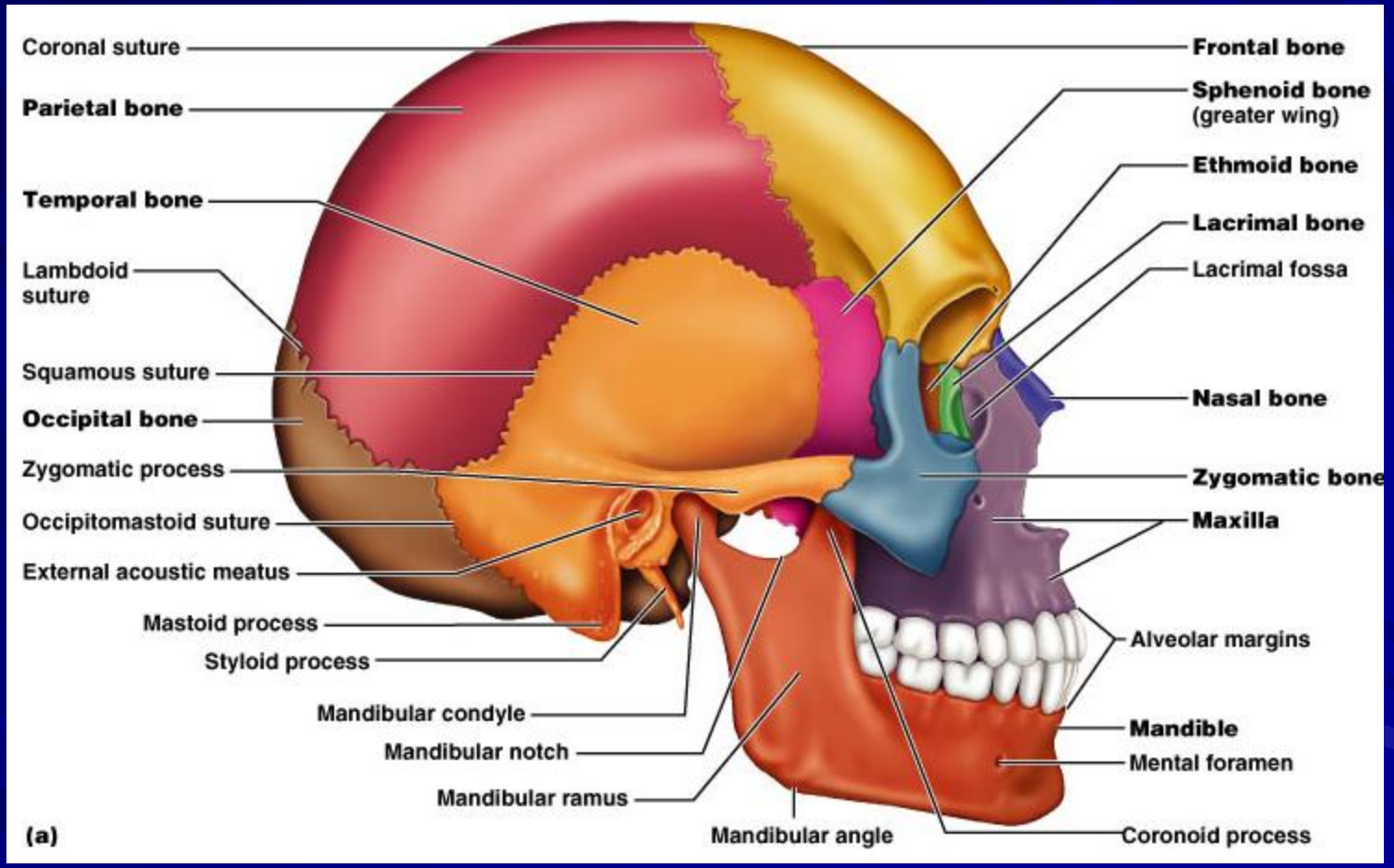
Developed by
John Gallagher, MS, DVM

LAS POSITAS COLLEGE

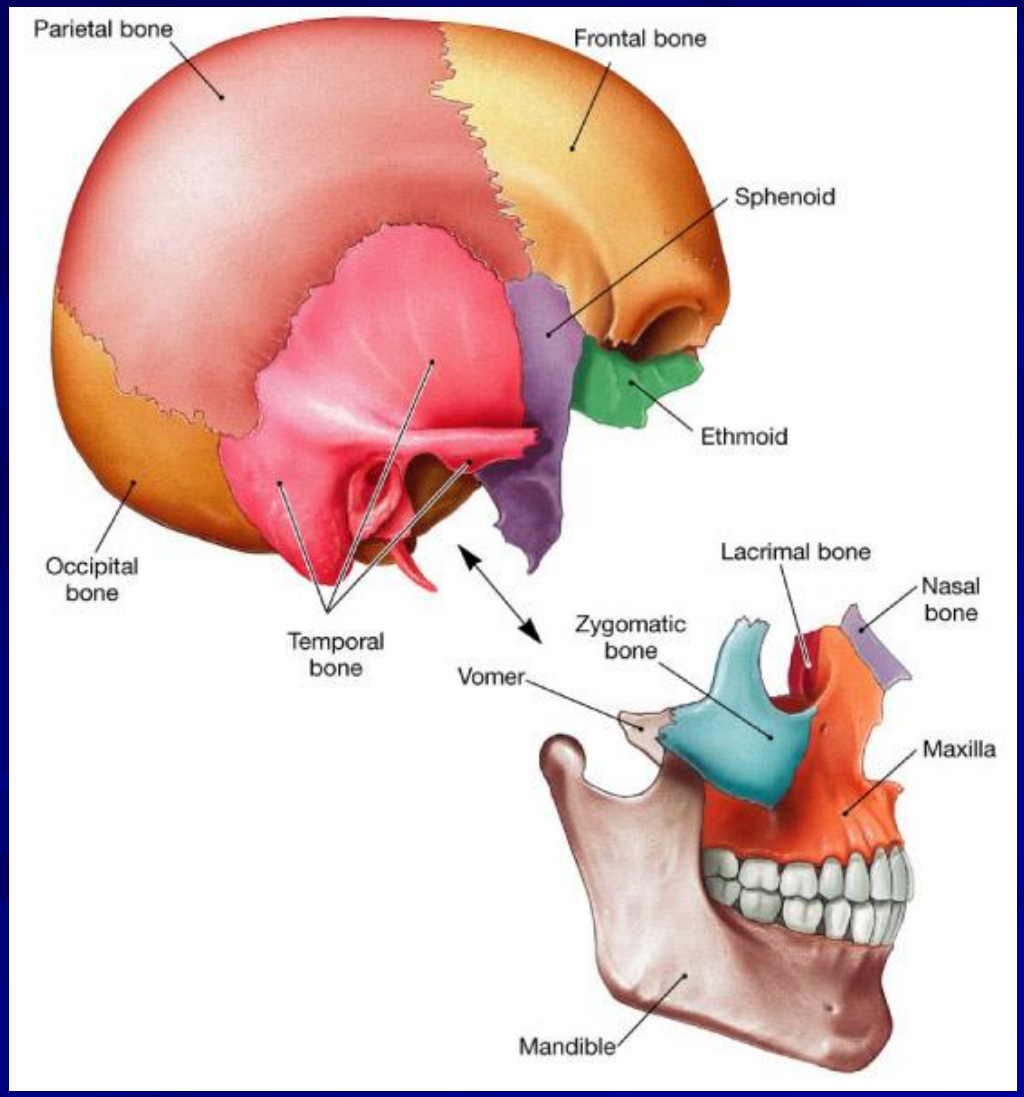
Bones of the Skull



Bones of the Skull, cont'd



Bones of the Skull, cont'd



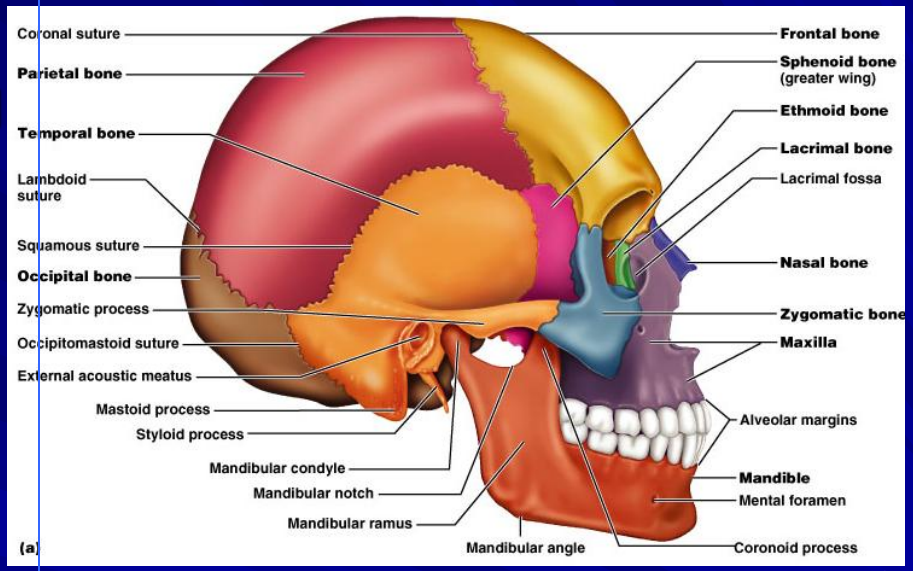
Cranial Bones, AKA calvarium

vs.

Facial Bones

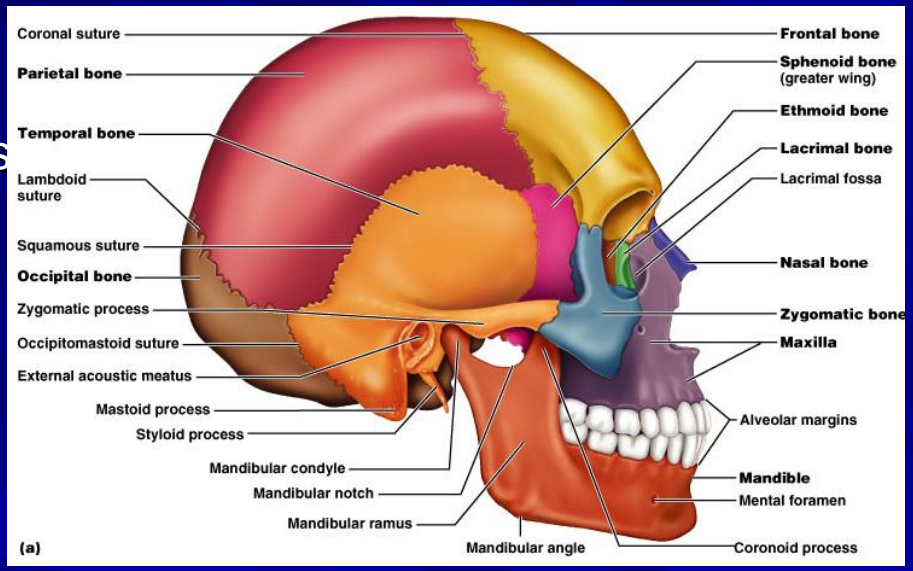
Bones of the Calvarium

- Frontal (forehead)
  - Anterior fossa of base of skull
  - Frontal Crests
    - More prominent in male
  - Frontal sinuses
- Parietal (2)
  - Sutures
- Occipital
  - Foramen Magnum
  - Occipital Condyles articulate with C_1
  - Occipital Crest



Bones of the Calvarium, cont'd

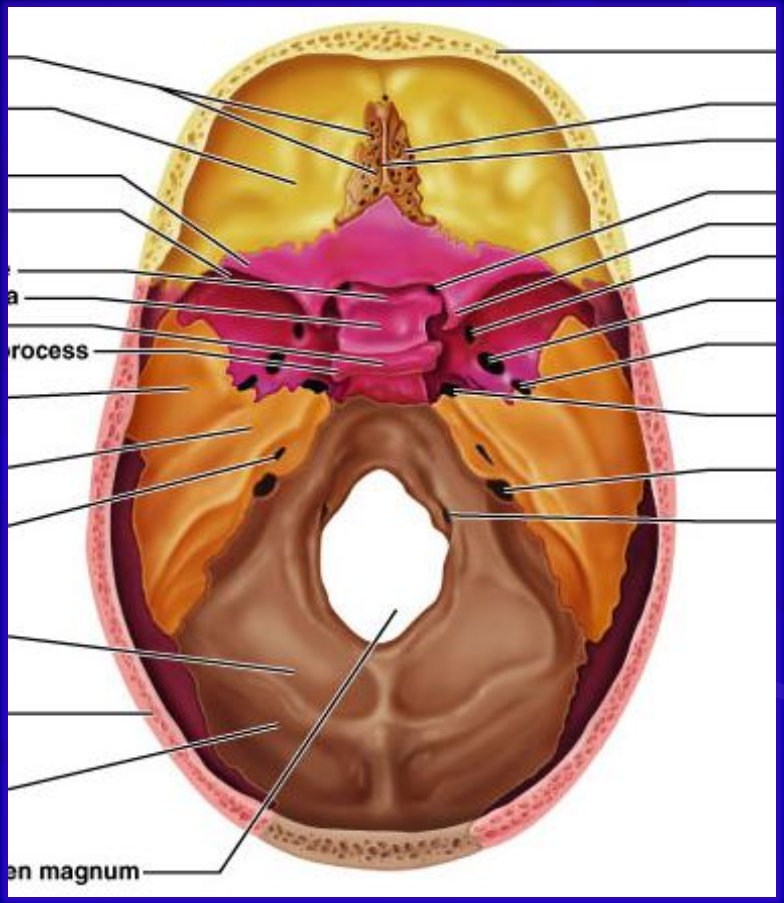
- Temporal (4 parts):
  - Squamous (very thin),
  - Mastoid (means breast-like) process
    - Small sinus
  - Petrous
    - Houses inner ear
    - Acoustic meatus
    - Jugular foramen
  - Zygomatic process
  - Styloid Process



"In one of these, the squamosal section of the temporal bone had been crushed, and another showed a jagged hole through the parietal bone."
The Bounty Trilogy, 1788

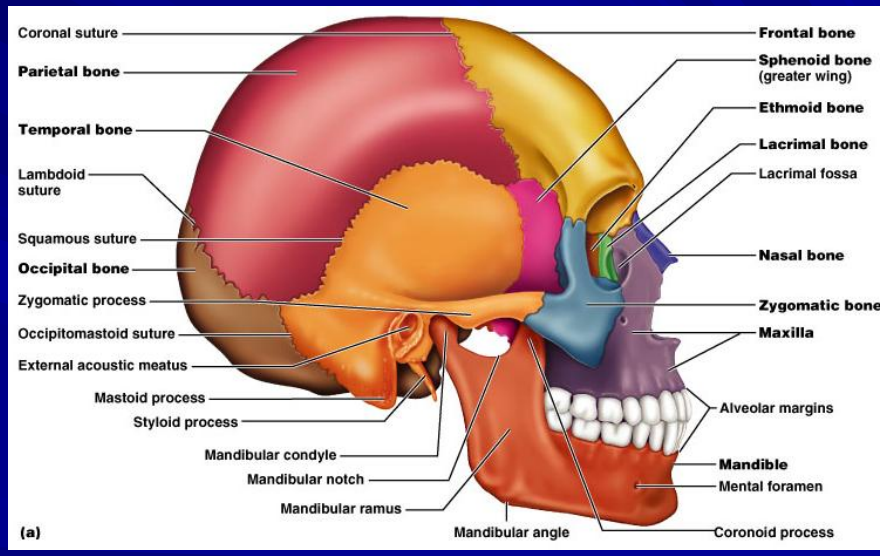
Bones of the Calvarium floor

- Sphenoid
  - Sella turcica houses pituitary gland
- Ethmoid (sieve)
  - Cribriform plate for olfactory nerve
  - Crista galli
  - Part of nasal septum
- Frontal
- Temporal
  - Petrous part
- Occipital
  - Foramen magnum



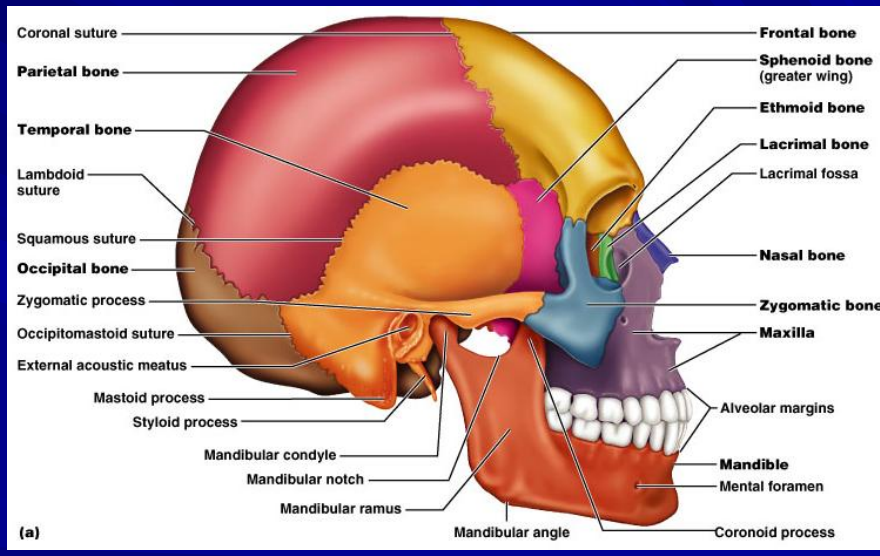
Facial bones

- Maxilla (2)
  - Alveolar margin for teeth
  - Maxillary sinus
  - Anterior portion of hard palate
- Palatine (2)
  - Posterior aspect of hard palate
- Nasal (2)
- Inferior Nasal conchae (2)
  - Will be covered in Respiratory System



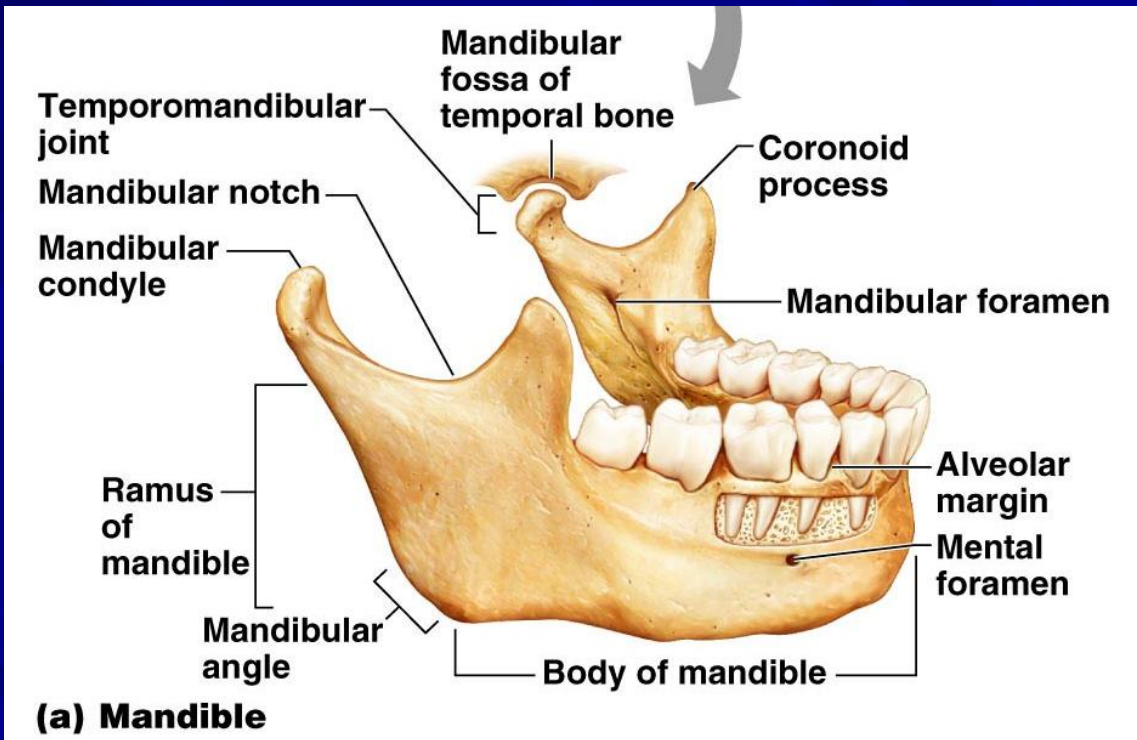
Facial bones, cont'd

- Zygomatic (2) AKA cheek bones
  - Zygomatic process of temporal bone
- Lacrimal (2)
  - Lacrimal sac
- Vomer
  - Part of nasal septum



Facial bones, cont'd

- Mandible
  - Mandibular condyles (TMJ)
  - Mandibular notch
  - Coronoid process
  - Ramus
  - Angle
  - Mental foramen



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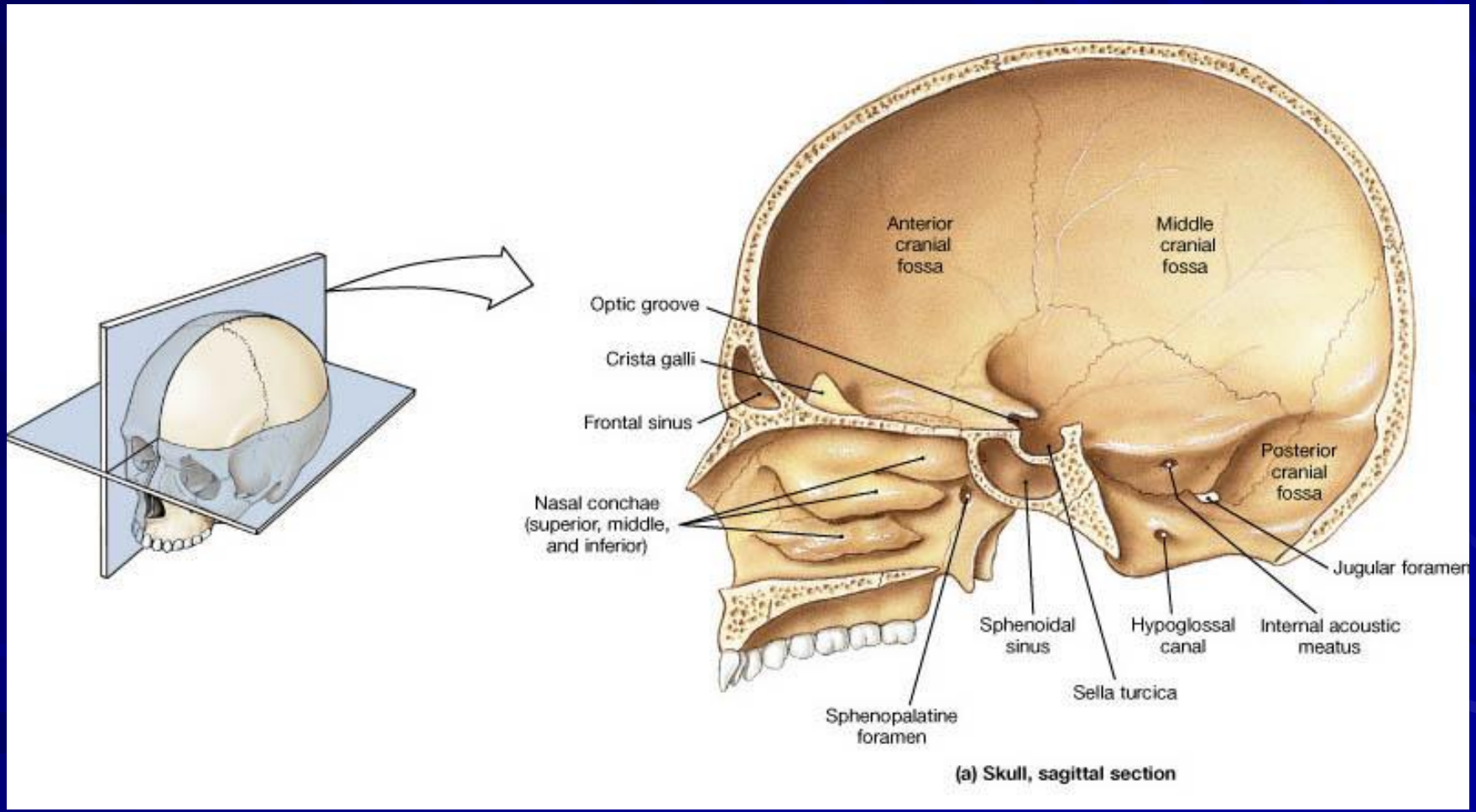
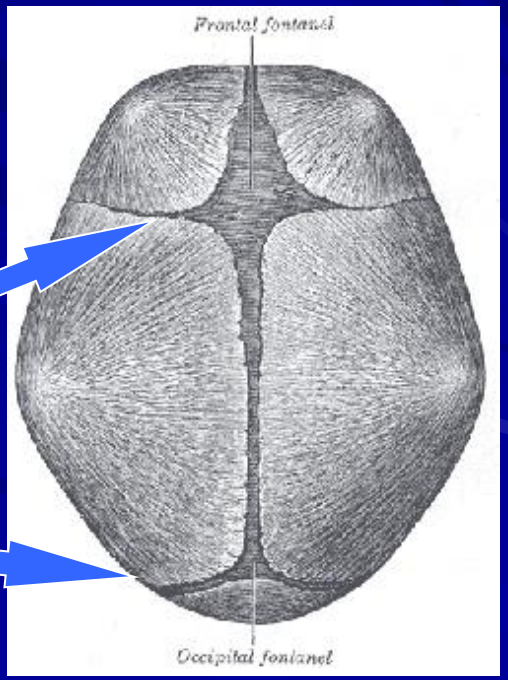

Anterior cranial fossa
Middle cranial fossa
Optic groove
Crista galli
Frontal sinus
Nasal conchae (superior, middle, and inferior)
Posterior cranial fossa
Jugular foramen
Sphenoidal sinus
Hypoglossal canal
Internal acoustic meatus
Sella turcica
Sphenopalatine foramen
(a) Skull, sagittal section

Sutures and Fontanels

- Fibrous Articulation, no movement, fused in adulthood
  - Lambdoidal—betw occipital and parietal
  - (mid) Saggital --- betw parietals
  - Coronal– betw frontal and parietals
  - Squamous – betw parietals and temporals
- Anterior and Posterior Fontanels
  - “Soft spot” of Newborn



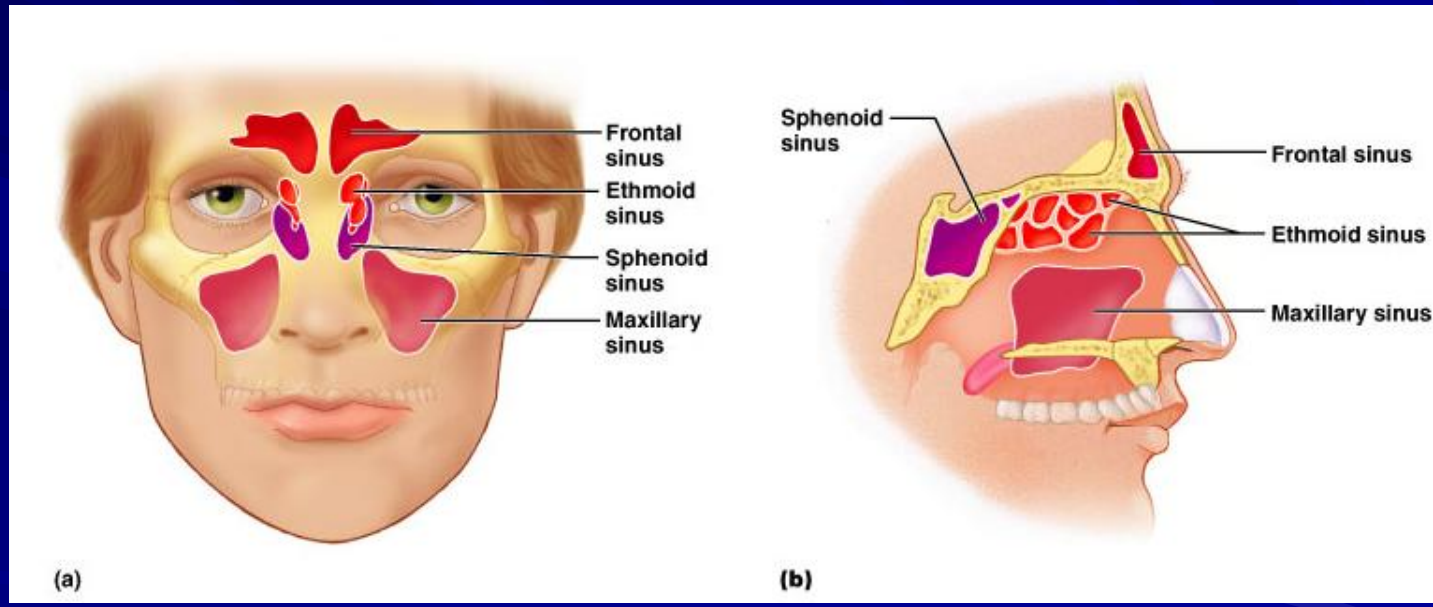
Paranasal Sinuses

Frontal

Ethmoid

Sphenoid

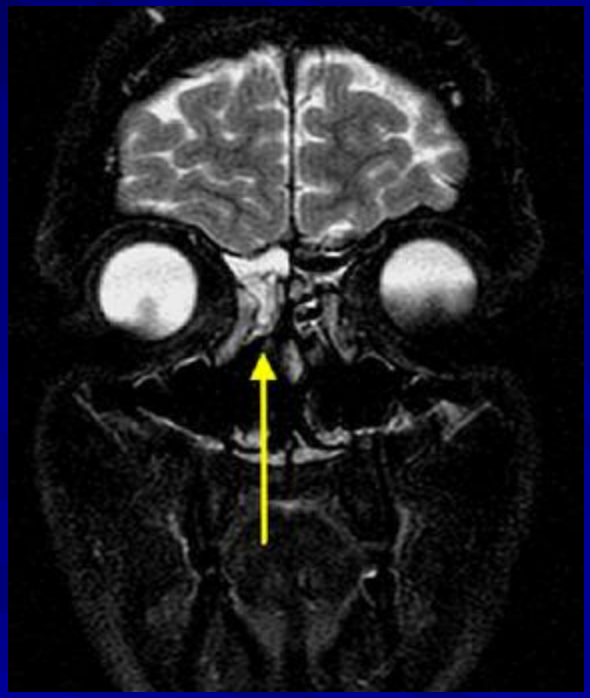
Maxillary



Narrow passageways from each sinus provide communication with nasal cavity

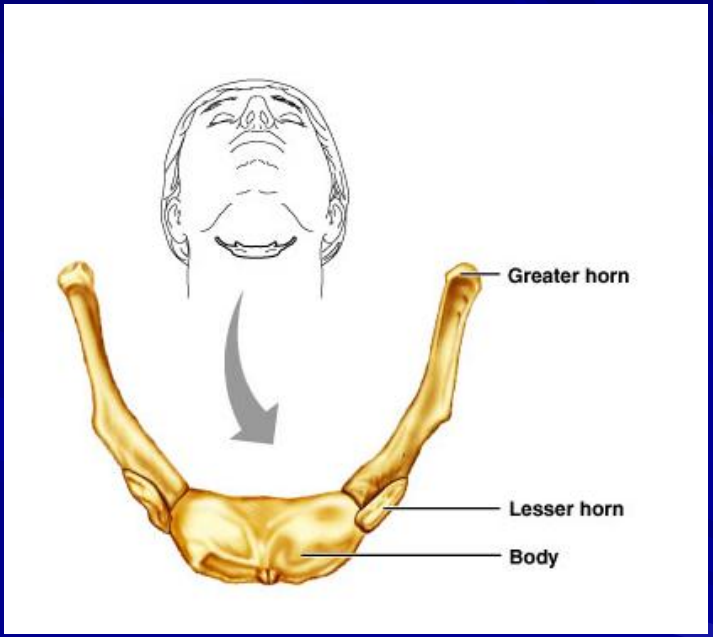
Sinusitis

- -itis = inflammation
- Bacterial, viral, fungal, allergic
- Swelling causes poor drainage and pressure differentials
  - Sinus headache
- Treatment might include decongestants, e.g., pseudephedrine



Hyoid Bone

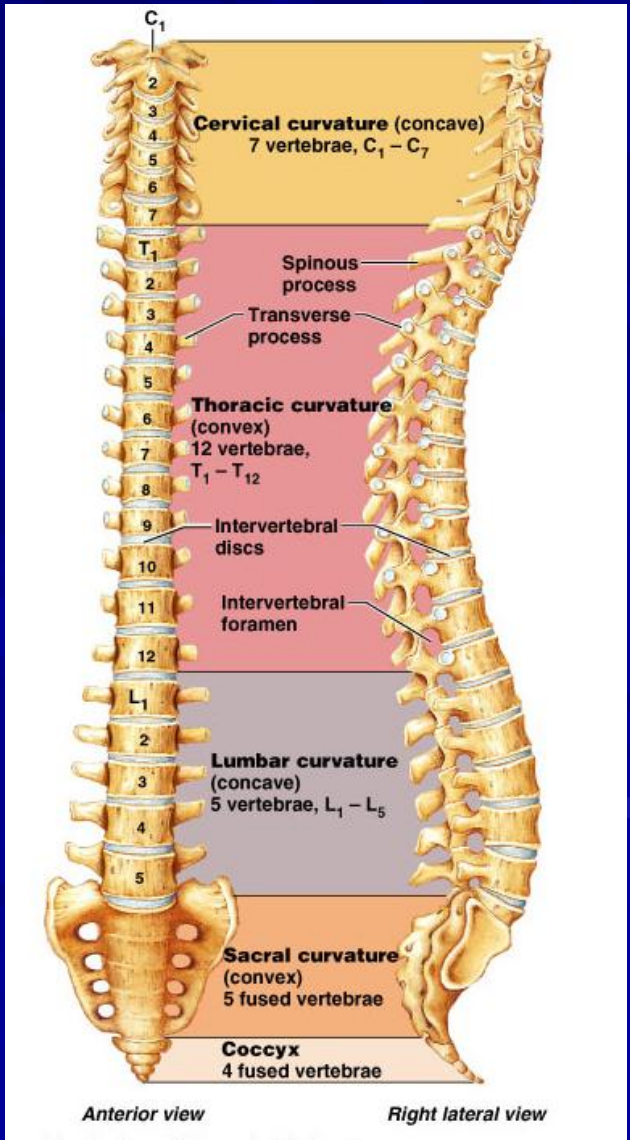
- Inferior to the mandible
- Superior to the larynx
- Supports many cervical muscles
- Supports the larynx



The Vertebral Column

- 7 Cervical
- 12 Thoracic
- 5 Lumbar
- 5 Sacral (fused)
- 4 Coccygeal (usually)

- Curvatures:
  Cervical, Thoracic,
  Lumbar, Sacral



A “Typical” Vertebra

Body and intervertebral disks

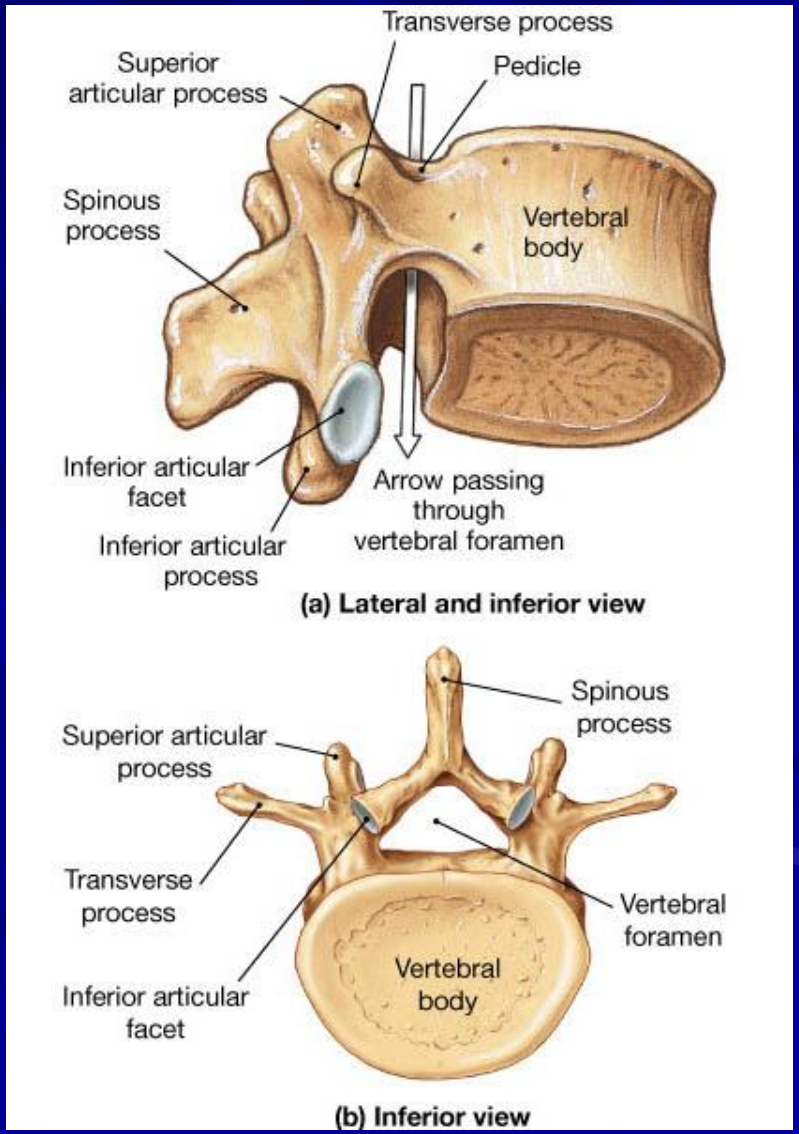
Spinous Process

Intervertebral Foramina

Articular processes/facets
- Superior
- Inferior

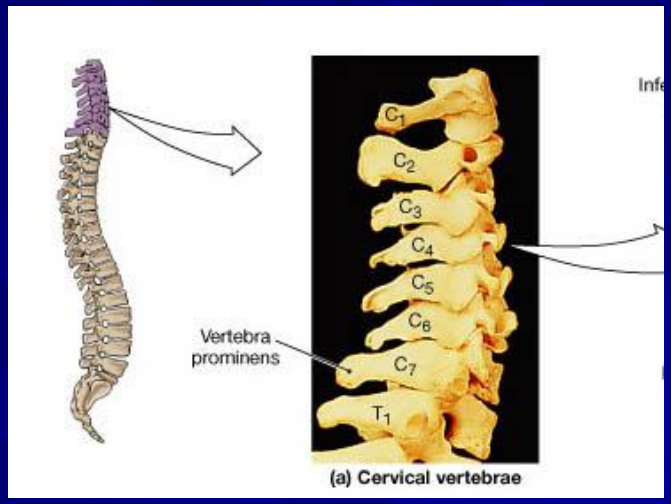
Vertebral (neural) Arch
- Pedicles and Laminae

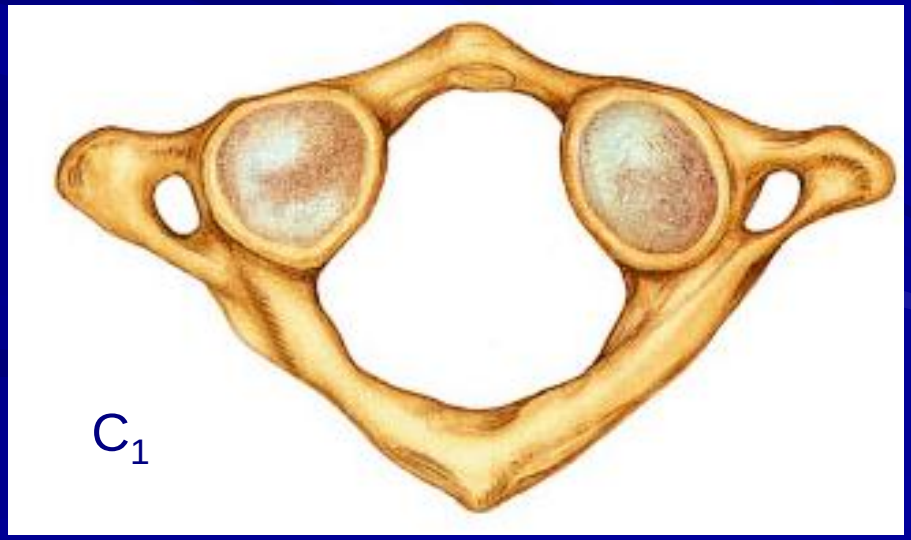
Vertebral Canal/foramen



Cervical Vertebrae (C_1 – C_7)

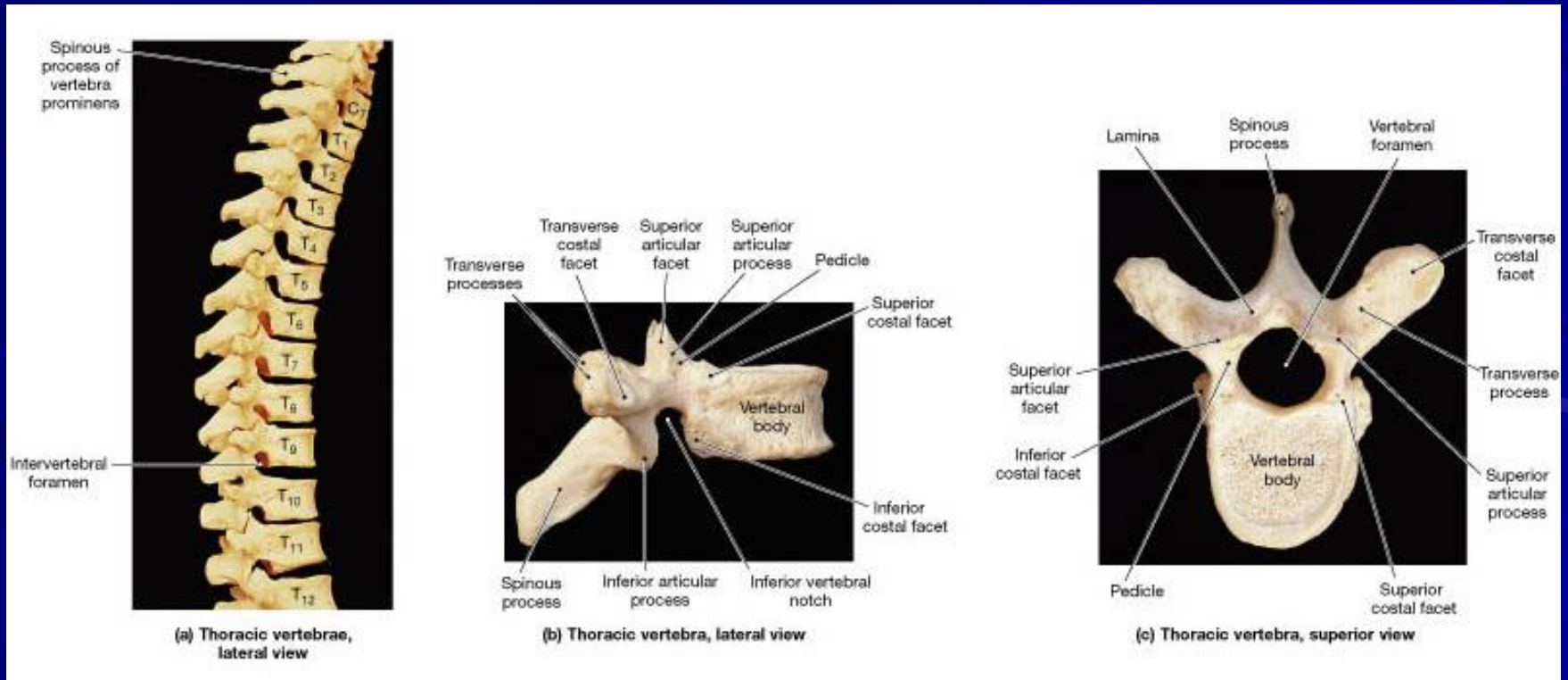
- C_1 = Atlas (no body)
- C_1-C_2 – site of rotation
- C_2 = Axis (dens)
- C_3 - C_6 are similar
- Note the transverse foramina in each cervical vertebra
  - Vertebral Artery/Vein
- C_7 has the vertebra prominens





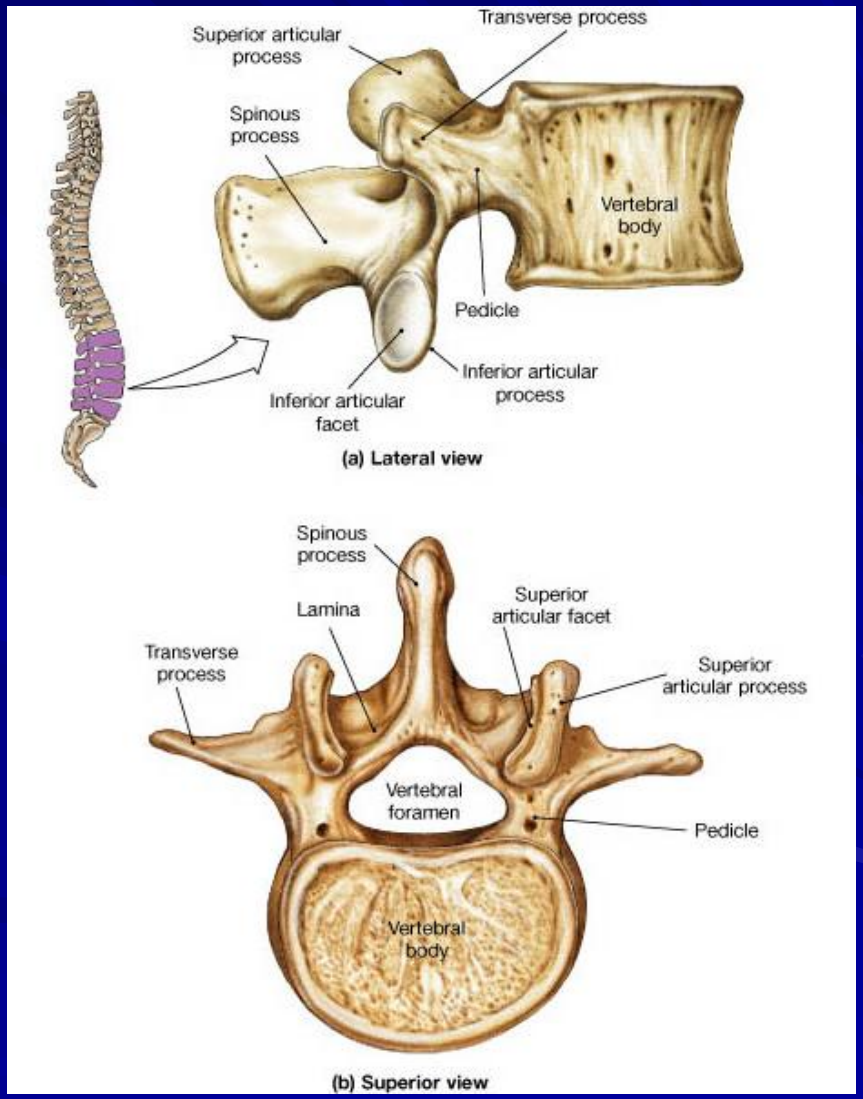
Thoracic Vertebrae (T_1 - T_{12})

Large Spinous Processes
Articulations for ribs, both superior and inferior

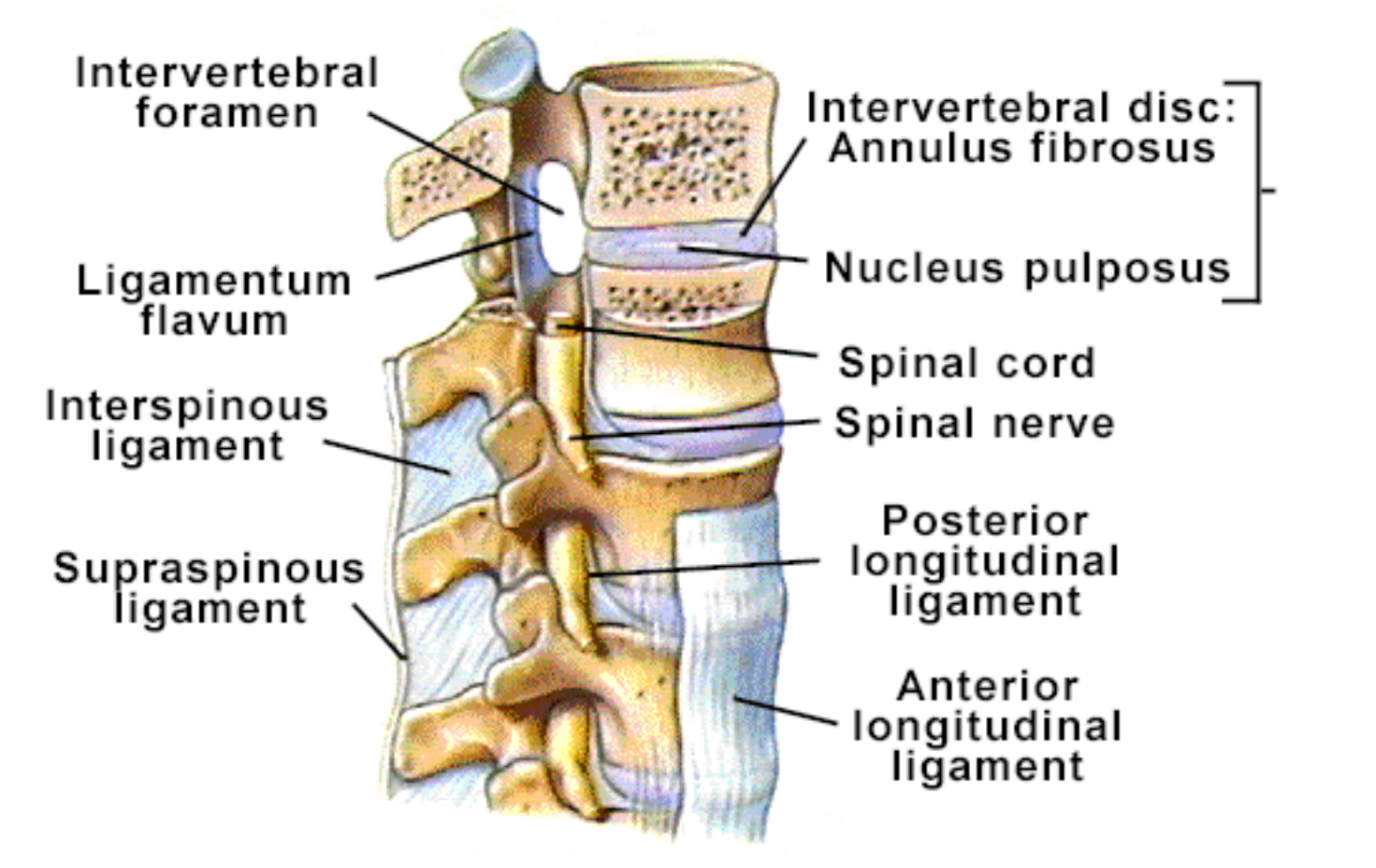


Lumbar Vertebrae (L_1 - L_5)

- Body
- Spinous Process
- Lamina
- Articular Facets
- Transverse Process
- Pedicle



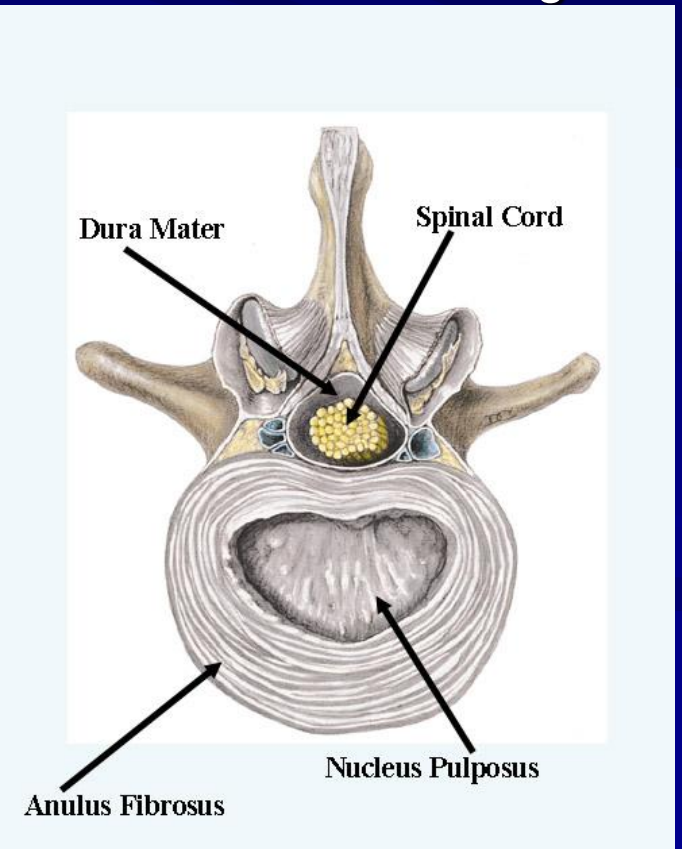
Intervertebral Articulation

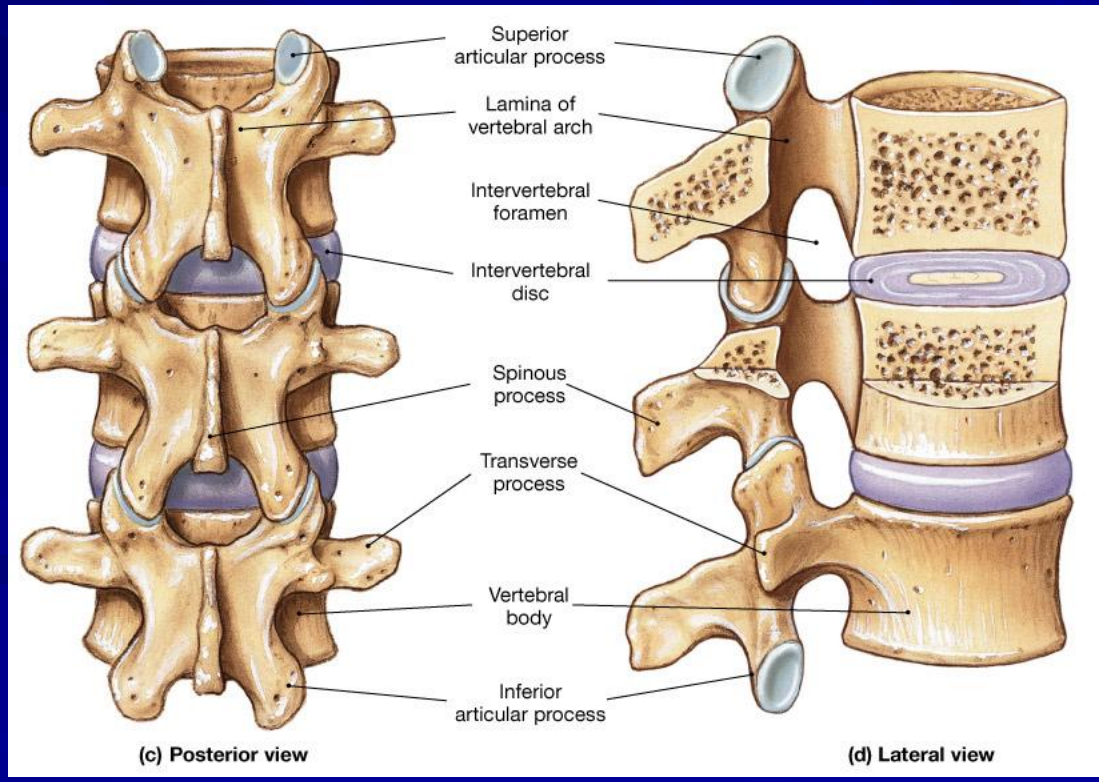


Intervertebral Disk

- Nucleus Pulposus
- Annulus Fibrosus
  - Fibrocartilage

See Fig. 8-9





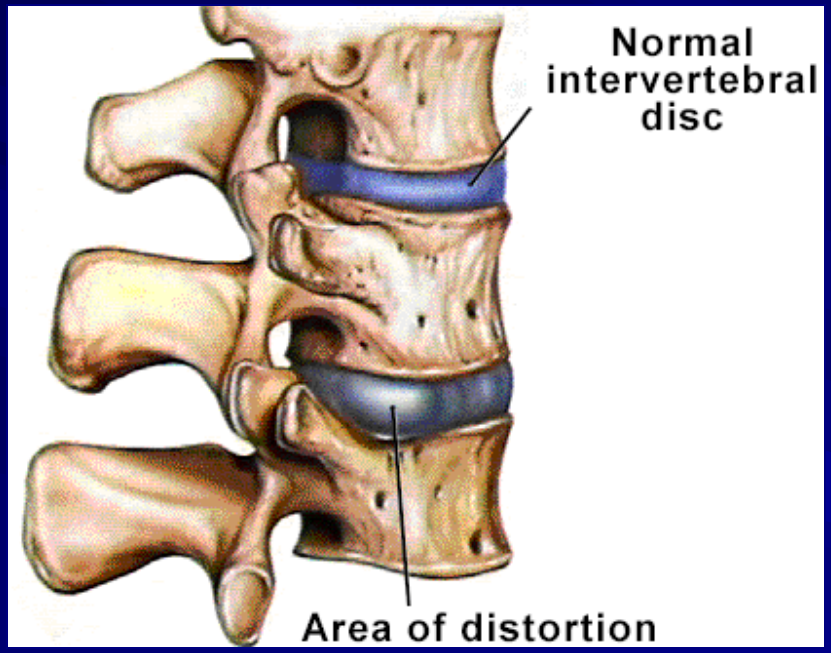
Disc Problems

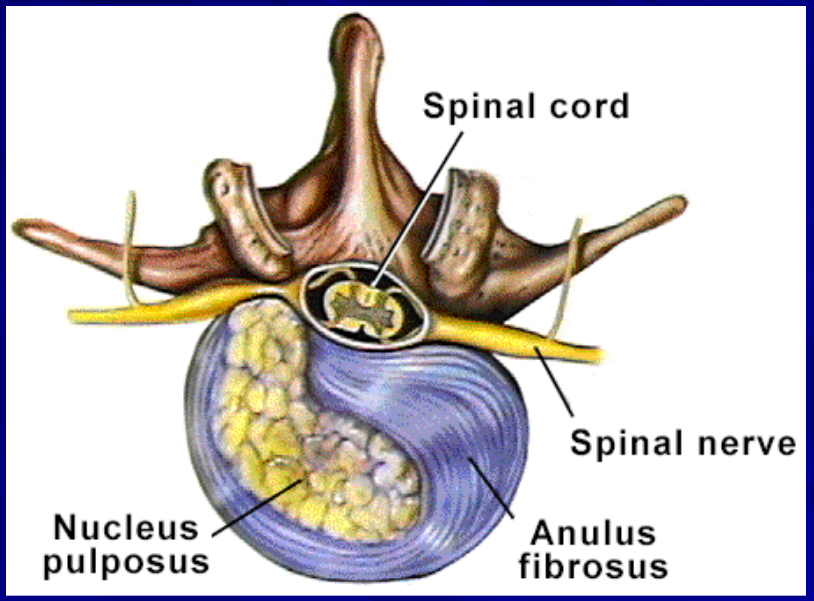
- Most common sites for disc problems:
  - C5 - C6
  - L4 - L5
  - L5 - S1

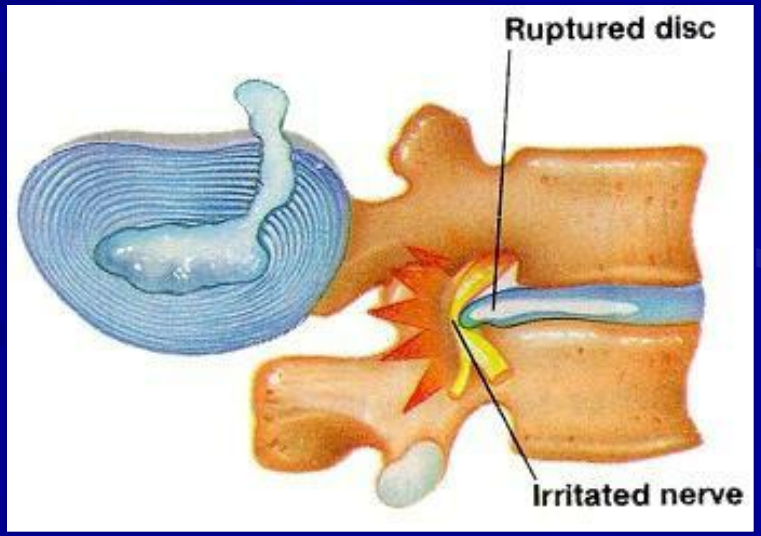
Fig 7.14

- Laminectomy (surgical removal vertebral arch by shaving laminae to access disc)

Damage to the Intervertebral Discs

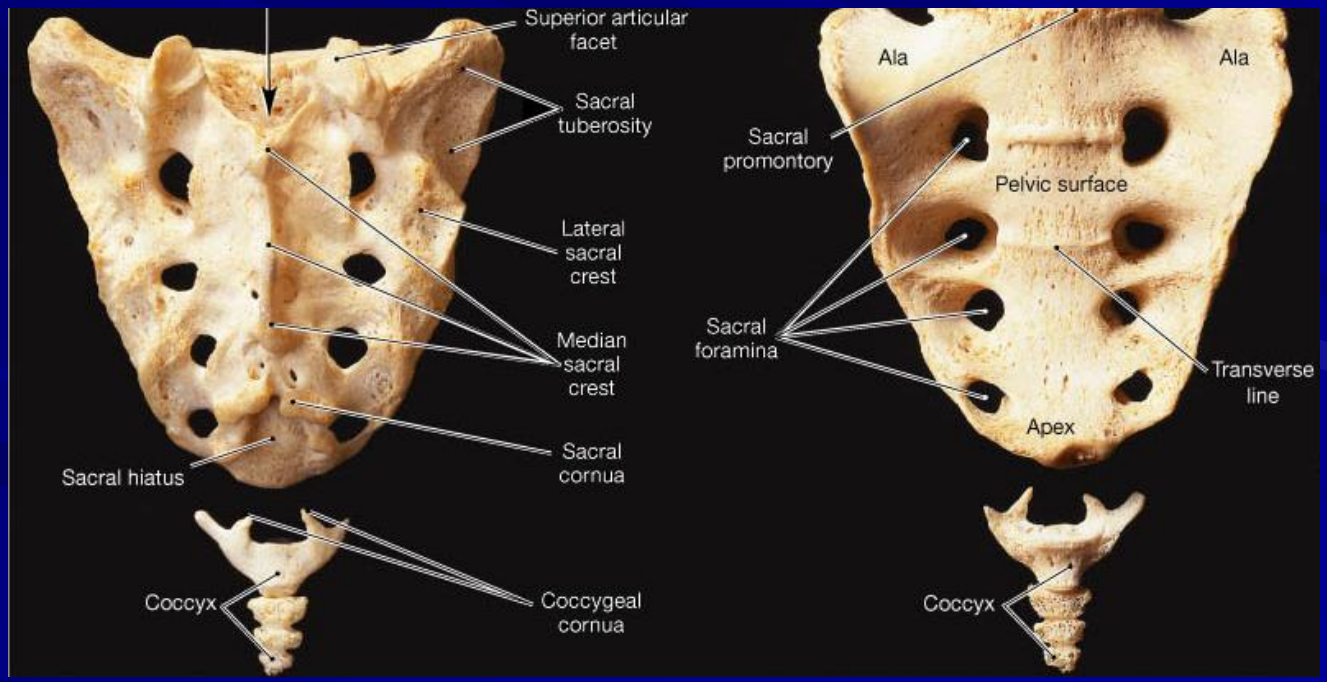






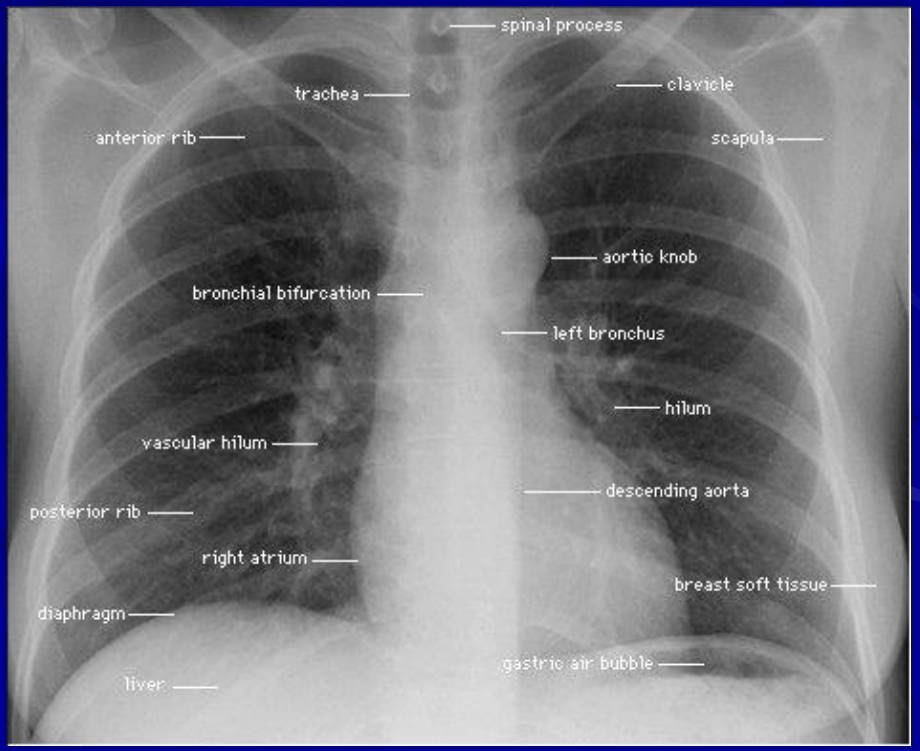
Sacrum (5 fused)
Coccyx (3-5 fused)

- Sacroiliac joint
- Sacral Foramina



Thoracic (Rib) Cage

- Protection and muscle attachments
- Ribs – 12 pairs
  - 1 - 7 are “true” ribs, with attachment to the sternum
  - 8 - 12 attach indirectly to the sternum, or not at all
- Costal Cartilages



Thoracic (Rib) Cage, cont'd

- Sternum
  - Manubrium
    - Clavicular Notch
  - Body
  - Xiphoid

Cliffs of Moher, Co Clare, Ireland